AMENDMENTS TO THE CLAIMS

Please cancel claims 1-33 as presented in the underlying International Application No. PCT/EP2004/053659 and add new claims 34-66 as shown in the listing of claims.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-33 (canceled)

Claim 34 (new): A microscope system comprising:

at least one lens configured to define an illumination field;

at least one light source configured to emit an illuminating light beam for illuminating a specimen through the lens;

at least one detector configured to, pixel-by-pixel, detect a detection light beam coming from the specimen;

an electronic circuit connected downstream from the detector, the electronic circuit including a memory unit configured to store a wavelength-dependent brightness distribution of an illumination field of the at least one lens, the electronic circuit configured to employ, pixel-by-pixel, the stored wavelength-dependent brightness distribution so as to form a homogeneously illuminated image field; and

an actuatable element configured to control, pixel-by-pixel, an intensity of the illuminating light beam as a function of the stored wavelength-dependent brightness distribution so as to homogeneously illuminate the illumination field.

Claim 35 (new): The microscope system as recited in claim 34 wherein the actuatable element includes a control circuit configured to directly control the intensity of the illuminating light beam as a function of the stored wavelength-dependent brightness distribution.

Claim 36 (new): The microscope system as recited in claim 34 wherein the actuatable element is disposed in the illuminating light beam.

Claim 37 (new): The microscope system as recited in claim 36 wherein:

the actuatable element includes an LCD matrix having individual pixels configured to be actuated according to the stored wavelength-dependent brightness distribution; and

the detector includes a CCD chip.

Claim 38 (new): The microscope system as recited in claim 34 further comprising a scanning device disposed in the illuminating light beam and configured to conduct, pixel-by-pixel, the illuminating light beam over or through the specimen.

Claim 39 (new): The microscope system as recited in claim 34 wherein the actuatable element includes an acousto-optic element configured to be actuated as a function of the stored wavelength-dependent brightness distribution so that the illumination field has a homogeneous brightness distribution.

Claim 40 (new): The microscope system as recited in claim 39 wherein the acousto-optic element includes at least one of an AOTF, an AOBS and an AOM.

Claim 41 (new): The microscope system as recited in claim 34 wherein the at least one light source includes at least one laser.

Claim 42 (new): The microscope system as recited in claim 41 wherein the at least one laser includes a multiline laser.

Claim 43 (new): The microscope system as recited in claim 41 wherein the at least one laser is configured to emit a continuous wavelength spectrum.

Claim 44 (new): The microscope system as recited in claim 39 wherein:

the detector includes at least one light-sensitive element configured to serially capture pixels of the illumination field on the specimen; and

the electronic circuit is configured to combine the pixels so as to form the image field, the image field being computable with the wavelength-dependent brightness distribution.

Claim 45 (new): The microscope system as recited in claim 44 wherein the detector includes an SP module having at least one light-sensitive element.

Claim 46 (new): The microscope system as recited in claim 34 wherein the electronic circuit includes a Field-Programmable Gate Array.

Claim 47 (new): The microscope system as recited in claim 34 wherein the electronic circuit is implemented in a personal computer associated with the microscope.

Claim 48 (new): The microscope system as recited in claim 34 wherein the wavelength-dependent brightness distribution includes a model.

Claim 49 (new): The microscope system as recited in claim 48 wherein the wavelength-dependent brightness distribution is approximated as a polynomial of a higher order and respective coefficients of the model are approximated as a spline function or as a differently modeled spectral function.

Claim 50 (new): A method for the shading correction of at least one lens of a microscope system, the at least one lens defining an illumination field, the microscope system including at least one light source and at least one detector, the at least one light source being configured to emit an illuminating light beam for illuminating a specimen through the lens, the method comprising:

storing a wavelength-dependent brightness distribution of the illumination field in a memory unit of an electronic circuit;

actuating, pixel-by-pixel, an actuatable element with the wavelength-dependent brightness distribution so as to illuminate the illumination field homogeneously;

detecting, pixel-by-pixel, a detection light beam coming from the specimen; and

employing the wavelength-dependent brightness distribution on an image field captured with the lens.

Claim 51 (new): The method as recited in claim 50 further comprising determining the wavelength-dependent brightness distribution using the detector in a pixel-by-pixel manner for each of the at least one lens.

Claim 52 (new): The method as recited in claim 50 wherein the actuatable element includes a control circuit, and further comprising directly controlling an intensity of the illuminating light beam as a function of the stored wavelength-dependent brightness distribution.

Claim 53 (new): The method as recited in claim 50 wherein the actuatable element is disposed in the illuminating light beam.

Claim 54 (new): The method as recited in claim 50 wherein the actuatable element includes an LCD matrix and wherein the detector includes a CCD chip, and further comprising determining a wavelength-dependent brightness distribution of the image field using the CCD chip.

Claim 55 (new): The method as recited in claim 50 further comprising disposing a scanning device in the illuminating light beam, and conducting the illuminating light beam pixel-by-pixel over or through the specimen using the scanning device.

Claim 56 (new): The method as recited in claim 50 wherein the actuatable element includes an acousto-optic element and wherein the actuating includes actuating the acousto-optic element as a function of the saved wavelength-dependent brightness distribution so that the illumination field has a homogeneous brightness distribution on or in the specimen.

Claim 57 (new): The method as recited in claim 56 wherein the acousto-optic element includes at least one of an AOTF, an AOBS and an AOM.

Claim 58 (new): The method as recited in claim 50 wherein the light source includes at least one laser.

Claim 59 (new): The method as recited in claim 58 wherein the at least one laser includes a multiline laser.

Claim 60 (new): The method as recited in claim 58 wherein the at least one laser is configured to emit a continuous wavelength spectrum.

Claim 61 (new): The method as recited in claim 50 wherein the at least one detector includes at least one light-sensitive element, and further comprising serially capturing pixels of the illumination field on the specimen and, using the electronic circuit, combining the individual pixels so as to form the image field.

Claim 62 (new): The method as recited in claim 61 wherein the detector includes an SP module having at least one light-sensitive element.

Claim 63 (new): The method as recited in claim 50 wherein the electronic circuit includes a Field-Programmable Gate Array.

Claim 64 (new): The method as recited in claim 50 wherein the electronic circuit is implemented in a personal computer associated with the microscope system.

Claim 65 (new): The method as recited in claim 50 wherein the wavelength-dependent brightness distribution includes a model.

Claim 66 (new): The method as recited in claim 65 wherein the wavelength-dependent brightness distribution is approximated as a polynomial of a higher order and respective coefficients of the model are approximated as a spline function or as a differently modeled spectral function.